**W7 V2 MPL and MC**

0:10  
In this video, we're gonna dig a little bit deeper into what determines marginal cost, and we're gonna tie it to the marginal product of Labor.

0:17  
So a little bit of extra jargon, but we'll focus on the intuition.

0:19  
And then we'll talk about this relationship between marginal columns and average cost, because they were gonna use that on the graph in the next video.

0:28  
OK, marginal cost.

0:29  
You know this by now.

0:30  
Cost of the extra unit of output.

0:33  
Why does it cost?

0:34  
Because I need to hire more inputs.

0:36  
OK, now I'm not going to hire an infinite amount of inputs.

0:40  
Remember, firms are trying to minimize their cost because I want to maximize their profits.

0:43  
So I'm really focusing on just the least amount of Labor or any input I need to produce the extra cost.

0:49  
OK, Just kind of keep that in mind now, because I want to keep this simple.

0:54  
I'm just going to think about one input that I'm increasing and to be able to talk about it in a relevant way.

1:00  
I'm going to think about this one extra input as labour for the next few slides, which is why what I'm going to talk about now is output and its relationship with the extra unit of labour.

1:12  
OK, I want to produce more.

1:14  
I hire more workers.

1:16  
How many workers do I hire?

1:17  
Well, first let me see how much this extra worker produces.

1:20  
OK, so if I hire one extra worker and I look at how much extra output I get, That extra output from that one worker is what we call the marginal product of labour.

1:31  
Labour because it's the worker product, because it's the output, the product that the worker produces, and marginal because it's the extra worker.

1:39  
One worker extra output.

1:42  
OK, so if one worker produces these many units of output, well, so if this is output and this is labour.

1:51  
If one unit of one worker produces these many units of output, if I just want one output because that's what marginal cost is, the cost of the extra output, well, how much labour do I need?

2:03  
Simple, straightforward.

2:05  
It's just 1 \* 1 divided by the marginal product of labour.

2:10  
OK, so to produce one extra unit of output, I would need to hire these many workers.

2:19  
How much does this worker cost?

2:22  
Well, what's the wage rate?

2:23  
What do I pay this extra worker?

2:25  
Right?

2:26  
Just the money that I would pay on the market.

2:28  
So the cost of the extra unit of output is hiring these many workers and paying each worker that wage.

2:37  
So you can see, again, no memorization required, it's just intuition.

2:41  
But the tricky part here is remembering this is the cost of the extra output unit and this is the extra labour required.

3:01  
But you can kind of see now, now we have a relationship between cost and worker productivity.

3:05  
If for example, every worker becomes more productive than before, what happens to my cost of producing output?

3:13  
Mathematically you can do this and fine, you should do that from the equation.

3:16  
What's the intuition?

3:18  
I have an extra worker, and now that worker's producing a lot more than before.

3:22  
So it means that to produce that extra 1 output, I need to hire less labour than before.

3:28  
My workers are more productive.

3:30  
I hire less labor than before if I hire less labor than before if the wage rate has not changed.

3:36  
Remember, all our thinking is all as held fixed.

3:38  
So if I'm just increasing worker productivity holding everything else fixed, my cost is going to go down, right?

3:45  
So when we talk about things happening in the environment where like, oh, worker productivity goes up or down, you can immediately through logic without memorization tied to what's happening to your costs.

3:56  
We use this when we talk about changes in the environment.

3:58  
So for example, we'll say staff is changing in the environment or wages are going up, right?

4:03  
Workers have negotiated higher wages or market wages have changed.

4:09  
How does that affect your costs?

4:11  
Workers have working with different technology.

4:13  
IGPT has now made every worker more productive.

4:16  
What is that going to do to my costs as a firm, right?

4:19  
What inputs can I change?

4:21  
Maybe I can't hire more labor because there's no labor available, and I got to scale up the size of my factory, or scale down the size of my factory, or I can't change the size of my factory.

4:30  
These things will affect your costs, and you're only going to be able to work through them if you're thinking carefully about what the cost components are.

4:39  
Now I want to talk about the relationship between averages and marginals, because we're going to use that on a graph.

4:45  
Students again get confused with this and I think costs are different from anything else.

4:50  
One thing I know each one of you is always calculating is what your average GPA is.

4:55  
OK, so let's use that in here.

4:58  
You all know what your average GPA is and let's suppose coming into Eco one O 1, you have your average GPA and let's say it is now a 3.8.

5:06  
OK, and now you're looking at your ECO one O one grade and you're saying how is this grade going to change my average GPA?

5:14  
Is it going to increase my GPA or decrease my GPA?

5:18  
You guys already know this, right?

5:20  
What you know is that if you add or if your grade in Eco 101, this is your average.

5:28  
If your grade in ECO 101 is higher than your average, it's gonna pull your average up.

5:33  
If your grade in ECO 101 is lower than your average current average, it's gonna pull your grade down.

5:37  
It's logic.

5:38  
That's it.

5:38  
That's the simple logic we use here.

5:41  
OK?

5:43  
If I add something higher than my average, it's going to pull my average total cost up.

5:49  
But add something lower than my average variable cost is going to pull my variable cost lower.

5:55  
That's it.

5:55  
That's the logic in here.

5:56  
No memorization required, OK.

5:59  
If I add something that's the same as my average, it's not going to change my average, OK.

6:05  
Keep that in mind when we're looking at cost curves and then we can kind of think about the relationship between a marginal curve and an average curve.

6:13  
But here's what we've done.

6:14  
When you want to understand what's happening to marginal cost, you need to think about the input prices, sure, and all the opportunity costs associated with that.

6:23  
But also how inputs convert into output is important.

6:26  
So please add that into your thinking.

6:29  
And then the relationship between averages and marginals just depends on whether the extra that you're adding is higher or lower than your current average.